

Claims

What is claimed is:

1. A method of characterizing hardware resource dependencies in a multi-channel communications system, comprising:

5 identifying constraints and interdependencies among hardware resources based on both stored system and queried hardware resource characteristics; and

generating an abstract resource specification based on the identifying of hardware resource constraints and interdependencies for use during hardware resource allocation to enable maximum preservation of most functional and least available hardware resources during hardware resource allocation.

2. The method of claim 1, wherein the identifying of constraints and interdependencies among hardware resources comprises identifying system communications domains that contain system hardware resources.

3. The method of claim 1, wherein the identifying of constraints and interdependencies among hardware resources comprises identifying managed hardware resources from among the system hardware resources.

4. The method of claim 1, wherein the identifying of constraints and interdependencies among hardware resources comprises identifying hardware resource groups and hardware resource group boundaries among the system hardware resources.

5. The method of claim 4, wherein the identifying of constraints and interdependencies among hardware resources comprises assigning association labels to the system hardware resources to identify relationships, if any, between the system hardware resources and external hardware, to identify redundant resources within respective ones of the hardware resource groups, and to characterize dedicated coupling between individual ones of the system hardware resources.

6. A hardware resource identifier for a multi-channel communications system, comprising:

a hardware resource interdependency tracking device for recognizing constraints among available system hardware resources;

an association labeling device for assigning association labels to certain of the system hardware resources having constraints identified by the hardware resource interdependency tracking device; and

a processor for interpreting an abstract resource specification identifying the available system hardware resources and the constraints associated therewith in a manner that enables maximum preservation of most functional and least available hardware resources during hardware resource allocation.

7. The hardware resource identifier of claim 6, further comprising a resource domain identifier for differentiating domains of system hardware resources for use by the processor in interpreting the abstract resource specification.

8. The hardware resource identifier of claim 6, further comprising a managed hardware resource identifier for identifying managed hardware resources from among the system hardware resources for use by the processor in interpreting the abstract resource specification.

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9. The hardware resource identifier of claim 6, further comprising a hardware resource group and group boundary identifier for identifying hardware resource groups and group boundaries of the system hardware resources for use by the processor in interpreting the abstract resource specification.

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10. The hardware resource identifier of claim 9, further comprising an association labeler for assigning association labels to the system hardware resources to identify relationships, if any, between the system hardware resources and external hardware, to identify redundant hardware resources within respective ones of the hardware resource groups, and to characterize dedicated coupling between individual ones of the system hardware resources for use by the processor in interpreting the abstract resource specification.

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11. A method of characterizing a hardware topology of a software-defined communications system, comprising:

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querying a static system hardware specification to identify hardware resource constraints and interdependencies;

performing a dynamic hardware resource investigation to identify hardware resource constraints and interdependencies in addition to those identified during the querying of a static system hardware specification; and

interpreting an abstract hardware resource specification for use during hardware resource allocation to facilitate maximum preservation of most functional and least available hardware resources while still enabling application hardware resource needs to be met.

12. The method of claim 11, wherein the performing of a dynamic hardware resource investigation comprises interpreting an abstract hardware resource description including virtual hardware resource objects which identify application hardware requirements.

13. The method of claim 11, wherein the performing of a dynamic hardware resource investigation comprises identifying system communications domains that contain system hardware resources.

14. The method of claim 1, wherein the performing of a dynamic hardware resource investigation comprises identifying system hardware resources that are managed hardware resources.

15. The method of claim 1, wherein the performing of a dynamic hardware resource investigation comprises identifying hardware resource groups and hardware resource group boundaries among system hardware resources.

16. The method of claim 15, wherein the performing of a dynamic hardware resource investigation comprises assigning association labels to system hardware resources to identify relationships, if any, between the system hardware resources and external hardware, to identify redundant resources within respective ones of the hardware resource groups, and  
5 to characterize dedicated coupling between individual ones of the system hardware resources.

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